

Claims

We claim:

- 5           1.       A compound of formula (I)



wherein

Y is selected from the group consisting of  $\text{OR}^1$  and  $\text{NHOH}$ ;

10        $\text{R}^2$  and  $\text{R}^4$  are independently selected from the group consisting of H and a moiety (optionally substituted with  $\text{R}^{10}$ ) selected from  $\text{C}_{1-6}$  alkyl,  $\text{C}_{2-6}$  alkenyl, aryl,  $\text{C}_{1-6}$  alkyl-aryl, heteroaryl,  $\text{C}_{1-6}$  alkyl-heteroaryl, heterocycloalkyl,  $\text{C}_{1-6}$  alkyl-heterocycloalkyl, cycloalkyl and  $\text{C}_{1-6}$  alkyl-cycloalkyl;

$\text{R}^1$  and  $\text{R}^3$  and  $\text{R}^5$  are independently selected from the group consisting of H and  $\text{C}_{1-6}$  alkyl;

15       provided that not more than two of  $\text{R}^2$ ,  $\text{R}^3$ ,  $\text{R}^4$  and  $\text{R}^5$  are H; or

any of  $\text{CR}^2\text{R}^3$ ,  $\text{CR}^4\text{R}^5$  and  $\text{CR}^2\text{-CR}^4$  is a cycloalkyl or heterocycloalkyl ring optionally substituted with  $\text{R}^{10}$  or a group (optionally substituted with  $\text{R}^{10}$ ) selected from  $\text{C}_{1-6}$  alkyl, aryl,  $\text{C}_{1-6}$  alkyl-aryl, heteroaryl and  $\text{C}_{1-6}$  alkyl-heteroaryl;

20       B is selected from the group consisting of  $\text{C}_{1-8}$  alkyl,  $\text{C}_{2-6}$  alkenyl and  $\text{C}_{2-6}$  alkynyl, and is substituted with  $\text{R}^6$ ;

$\text{R}^6$  is selected from the group consisting of  $\text{N(R}^7\text{)}_2$ ,  $\text{OR}^7$ ,  $\text{COR}^7$ ,  $\text{C(=NOR}^7\text{)R}^7$ ,  $\text{NR}^7\text{R}^8$ ,  $\text{S(O)}_{0-2}\text{R}^9$ , and  $\text{SO}_2\text{N(R}^7\text{)}_2$ ;

25        $\text{R}^7$  is selected from the group consisting of H and a moiety selected from  $\text{C}_{1-6}$  alkyl, aryl,  $\text{C}_{1-6}$  alkyl-aryl, heteroaryl,  $\text{C}_{1-6}$  alkyl-heteroaryl, cycloalkyl,  $\text{C}_{1-6}$  alkyl-cycloalkyl, heterocycloalkyl and  $\text{C}_{1-6}$  alkyl-heterocycloalkyl, wherein said moiety is optionally substituted with  $\text{R}^9$ ,  $\text{COR}^9$ ,  $\text{SO}_{0-2}\text{R}^9$ ,  $\text{CO}_2\text{R}^9$ ,  $\text{OR}^9$ ,  $\text{CONR}^1\text{R}^9$ ,  $\text{NR}^1\text{R}^9$ , halogen, CN,  $\text{SO}_2\text{NR}^1\text{R}^9$  or  $\text{NO}_2$ , and for each case of  $\text{N(R}^7\text{)}_2$  the  $\text{R}^7$  groups are the same or different, or  $\text{N(R}^7\text{)}_2$  is heterocycloalkyl optionally substituted with  $\text{R}^9$ ,  $\text{COR}^9$ ,  $\text{SO}_{0-2}\text{R}^9$ ,  $\text{CO}_2\text{R}^9$ ,  $\text{OR}^9$ ,  $\text{CONR}^1\text{R}^9$ ,  $\text{NR}^1\text{R}^9$ , halogen, CN,  $\text{SO}_2\text{NR}^1\text{R}^9$  or  $\text{NO}_2$ ;

30        $\text{R}^8$  is selected from the group consisting of  $\text{COR}^7$ ,  $\text{CON(R}^7\text{)}_2$ ,  $\text{CO}_2\text{R}^9$  and  $\text{SO}_2\text{R}^9$ ;

$\text{R}^9$  is selected from the group consisting of  $\text{C}_{1-6}$  alkyl, aryl,  $\text{C}_{1-6}$  alkyl-aryl, heteroaryl and  $\text{C}_{1-6}$  alkyl-heteroaryl; and

$R^{10}$  is selected from the group consisting of  $OR^7$ ,  $COR^7$ ,  $CO_2R^1$ ,  $CON(R^7)_2$ ,  $NR^7R^8$ ,  $S(O)_{0-2}R^9$ ,  $SO_2N(R^7)_2$ , CN, halogen and cycloimidyl (optionally substituted with  $R^1$ ); or

a salt, solvate, hydrate, N-oxide or protected amino, protected carboxy or protected hydroxamic acid derivative thereof.

2. The compound of claim 1, wherein  $R^2$  or  $R^4$  is optionally substituted  $C_{1-6}$  alkyl,  $C_{1-6}$  alkyl-heteroaryl, or  $C_{1-6}$  alkyl-heterocycloalkyl; or  $CR^2R^3$ ,  $CR^4R^5$  or  $CR^2-CR^4$  forms the said optionally substituted ring.

3. The compound of claim 1, wherein B is  $C_{1-8}$  alkyl substituted with  $R^6$ .

4. The compound of claim 3, wherein B is  $C_{1-8}$  alkyl substituted with  $OR^7$ .

5. The compound of claim 4, wherein  $R^7$  is optionally substituted aryl or heteroaryl.

6. The compound of claim 1, wherein  $S(O)_{0-2}$  is  $SO_2$ .

7. The compound of claim 1, selected from the group consisting of methyl 4-((3-(3-pyridyloxy)propylsulfanyl)methyl)tetrahydropyran-4-carboxylate, methyl 4-((3-(3-pyridyloxy)propylsulfonyl)methyl)tetrahydropyran-4-carboxylate, and 4-((3-(4-pyridyloxy)propylsulfonyl)methyl)tetrahydropyran-4-carboxylate.

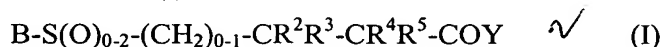
8. The compound of claim 1, selected from the group consisting of 2-(3-phenoxypropylsulfanyl)cyclopentanecarboxylic acid methyl ester, 2-(3-phenoxypropane-1-sulfonyl)cyclopentanecarboxylic acid methyl ester, 2-(3-phenoxypropane-1-sulfonyl)cyclopentanecarboxylic acid and 2-(3-phenoxypropane-1-sulfonyl)cyclopentanecarboxylic acid hydroxyamide.

9. A pharmaceutical composition for the use in therapy, comprising a compound of claim 1, and a pharmaceutically-acceptable diluent or carrier.

10. A method for the treatment of a condition selected from the group consisting of asthma, inflammation, inflammatory diseases, autoimmune, infectious or ocular diseases, age-related macular degeneration, and cancer, which comprises administering to a subject in need thereof an effective amount of a compound of claim 1.

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11. A compound of formula (I)



wherein

Y is selected from the group consisting of OR<sup>1</sup> and NHOH;

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R<sup>2</sup> and R<sup>4</sup> are independently selected from the group consisting of H and a moiety (optionally substituted with R<sup>10</sup>) selected from C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl, C<sub>1-6</sub> alkyl-heteroaryl, heterocycloalkyl, C<sub>1-6</sub> alkyl-heterocycloalkyl, cycloalkyl and C<sub>1-6</sub> alkyl-cycloalkyl;

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R<sup>1</sup>, R<sup>3</sup> and R<sup>5</sup> are independently selected from the group consisting of H and C<sub>1-6</sub> alkyl;

provided that not more than two of R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are H; or

any of CR<sup>2</sup>R<sup>3</sup>, CR<sup>4</sup>R<sup>5</sup> and CR<sup>2</sup>-CR<sup>4</sup> is a cycloalkyl or heterocycloalkyl ring optionally substituted with R<sup>10</sup> or a group (optionally substituted with R<sup>10</sup>) selected from C<sub>1-6</sub> alkyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl and C<sub>1-6</sub> alkyl-heteroaryl;

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B is C<sub>1-6</sub> alky-heterocycloalkyl group optionally substituted with R<sup>6</sup> or R<sup>7</sup>;

R<sup>6</sup> is selected from the group consisting of N(R<sup>7</sup>)<sub>2</sub>, OR<sup>7</sup>, COR<sup>7</sup>, C(=NOR<sup>9</sup>)R<sup>7</sup>, NR<sup>7</sup>R<sup>8</sup>, S(O)<sub>0-2</sub>R<sup>9</sup> and SO<sub>2</sub>N(R<sup>7</sup>)<sub>2</sub>;

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R<sup>7</sup> is selected from the group consisting of H and a moiety selected from C<sub>1-6</sub> alkyl, aryl, C<sub>1-6</sub> alky-aryl, heteroaryl, C<sub>1-6</sub> alky-heteroaryl, cycloalkyl, C<sub>1-6</sub> alkyl-cycloalkyl, heterocycloalkyl and C<sub>1-6</sub> alkyl-heterocycloalkyl, wherein said moiety is optionally substituted with R<sup>9</sup>, COR<sup>9</sup>, SO<sub>0-2</sub>R<sup>9</sup>, CO<sub>2</sub>R<sup>9</sup>, OR<sup>9</sup>, CONR<sup>1</sup>R<sup>9</sup>, NR<sup>1</sup>R<sup>9</sup>, halogen, CN, SO<sub>2</sub>NR<sup>1</sup>R<sup>9</sup> or NO<sub>2</sub>, and for each case of N(R<sup>7</sup>)<sub>2</sub> the R<sup>7</sup> groups are the same or different, or N(R<sup>7</sup>)<sub>2</sub> is heterocycloalkyl optionally substituted with R<sup>9</sup>, COR<sup>9</sup>, SO<sub>0-2</sub>R<sup>9</sup>, CO<sub>2</sub>R<sup>9</sup>, OR<sup>9</sup>, CONR<sup>1</sup>R<sup>9</sup>, NR<sup>1</sup>R<sup>9</sup>, halogen, CN, SO<sub>2</sub>NR<sup>1</sup>R<sup>9</sup> or NO<sub>2</sub>;

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R<sup>8</sup> is selected from the group consisting of COR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>9</sup> and SO<sub>2</sub>R<sup>9</sup>;

R<sup>9</sup> is selected from the group consisting of C<sub>1-6</sub> alkyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl and C<sub>1-6</sub> alkyl-heteroaryl; and

$R^{10}$  is selected from the group consisting of  $OR^7$ ,  $COR^7$ ,  $CO_2R^1$ ,  $CON(R^7)_2$ ,  $NR^7R^8$ ,  $S(O)_{0-2}R^9$ ,  $SO_2N(R^7)_2$ , CN, halogen and cycloimidyl (optionally substituted with  $R^1$ ); or  
a salt, solvate, hydrate, N-oxide or protected amino, protected carboxy or protected hydroxamic acid derivative thereof.

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12. The compound of claim 11, wherein  $R^2$  or  $R^4$  is optionally substituted  $C_{1-6}$  alkyl,  $C_{1-6}$  alkyl-heteroaryl, or  $C_{1-6}$  alkyl-heterocycloalkyl; or  $CR^2R^3$ ,  $CR^4R^5$  or  $CR^2-CR^4$  forms the said optionally substituted ring.

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13. The compound of claim 11, wherein the alkyl group in B is selected from the group consisting of ethyl and propyl.

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14. The compound of claim 11, wherein the heterocycloalkyl group in B is selected from the group consisting of azetidiny, pyrrolidiny and piperdiny, aryl which is substituted with  $R^7$ .

15. The compound of claim 14, wherein  $R^7$  is optionally substituted aryl or heteroaryl.

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16. The compound of claim 11, wherein  $S(O)_{0-2}$  is  $SO_2$ .

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17. The compound of claim 11, selected from the group consisting of  
1-{2-[1-(4-nitrophenyl)pyrrolidin-3-yl]ethylsulfanylmethyl}cyclobutanecarboxylic acid ethyl ester,  
1-{2-[1-(4-nitrophenyl)pyrrolidin-3-yl]ethanesulfonylmethyl}cyclobutanecarboxylic acid ethyl ester,  
1-{2-[1-(4-nitrophenyl)pyrrolidin-3-yl]ethanesulfonylmethyl}cyclobutanecarboxylic acid and  
2-(piperidin-4-ylsulfanyl)cyclopentanecarboxylic acid methyl ester.

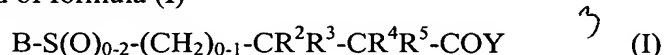
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18. A pharmaceutical composition for use in therapy, comprising a compound of claim 11, and a pharmaceutically-acceptable diluent or carrier.

19. A method for the treatment of a condition selected from the group consisting of asthma, inflammation, inflammatory diseases, autoimmune, infectious or ocular diseases, age-related macular degeneration, and cancer, which comprises administering to a subject in need thereof an effective amount of a compound of claim 11.

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20. A compound of formula (I)



wherein

Y is selected from the group consisting of OR<sup>1</sup> and NHOH;

10 R<sup>2</sup> and R<sup>4</sup> are independently selected from the group consisting of H and a moiety (optionally substituted with R<sup>10</sup>) selected from C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl, C<sub>1-6</sub> alkyl-heteroaryl, heterocycloalkyl, C<sub>1-6</sub> alkyl-heterocycloalkyl, cycloalkyl and C<sub>1-6</sub> alkyl-cycloalkyl;

15 R<sup>1</sup>, R<sup>3</sup> and R<sup>5</sup> are independently selected from the group consisting of H and C<sub>1-6</sub> alkyl;

provided that not more than two of R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are H; or

any of CR<sup>2</sup>R<sup>3</sup>, CR<sup>4</sup>R<sup>5</sup> and CR<sup>2</sup>-CR<sup>4</sup> is a cycloalkyl or heterocycloalkyl ring optionally substituted with R<sup>10</sup> or a group (optionally substituted with R<sup>10</sup>) selected from C<sub>1-6</sub> alkyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl and C<sub>1-6</sub> alkyl-heteroaryl;

20 B is heterocycloalkyl, optionally substituted with R<sup>6</sup> or R<sup>7</sup>, bonded through a C atom to S(O)<sub>0-2</sub>.

R<sup>6</sup> is selected from the group consisting of N(R<sup>7</sup>)<sub>2</sub>, OR<sup>7</sup>, COR<sup>7</sup>, C(=NOR<sup>9</sup>)R<sup>7</sup>, NR<sup>7</sup>R<sup>8</sup>, S(O)<sub>0-2</sub>R<sup>9</sup> and SO<sub>2</sub>N(R<sup>7</sup>)<sub>2</sub>;

25 R<sup>7</sup> is selected from the group consisting of H and a moiety selected from C<sub>1-6</sub> alkyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl, C<sub>1-6</sub> alkyl-heteroaryl, cycloalkyl, C<sub>1-6</sub> alkyl-cycloalkyl, heterocycloalkyl and C<sub>1-6</sub> alkyl-heterocycloalkyl, wherein said moiety is optionally substituted with R<sup>9</sup>, COR<sup>9</sup>, SO<sub>0-2</sub>R<sup>9</sup>, CO<sub>2</sub>R<sup>9</sup>, OR<sup>9</sup>, CONR<sup>1</sup>R<sup>9</sup>, NR<sup>1</sup>R<sup>9</sup>, halogen, CN, SO<sub>2</sub>NR<sup>1</sup>R<sup>9</sup> or NO<sub>2</sub>, and for each case of N(R<sup>7</sup>)<sub>2</sub> the R<sup>7</sup> groups are the same or different, or N(R<sup>7</sup>)<sub>2</sub> is heterocycloalkyl optionally substituted with R<sup>9</sup>, COR<sup>9</sup>, SO<sub>0-2</sub>R<sup>9</sup>, CO<sub>2</sub>R<sup>9</sup>, OR<sup>9</sup>, 30 CONR<sup>1</sup>R<sup>9</sup>, NR<sup>1</sup>R<sup>9</sup>, halogen, CN, SO<sub>2</sub>NR<sup>1</sup>R<sup>9</sup> or NO<sub>2</sub>;

R<sup>8</sup> is selected from the group consisting of COR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>9</sup> and SO<sub>2</sub>R<sup>9</sup>;

R<sup>9</sup> is selected from the group consisting of C<sub>1-6</sub> alkyl, aryl, C<sub>1-6</sub> alkyl-aryl, heteroaryl and C<sub>1-6</sub> alkyl-heteroaryl; and

$R^{10}$  is selected from the group consisting of  $OR^7$ ,  $COR^7$ ,  $CO_2R^1$ ,  $CON(R^7)_2$ ,  $NR^7R^8$ ,  $S(O)_{0-2}R^9$ ,  $SO_2N(R^7)_2$ , CN, halogen and cycloimidyl (optionally substituted with  $R^1$ ); or a salt, solvate, hydrate, N-oxide or protected amino, protected carboxy or protected hydroxamic acid derivative thereof.

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21. The compound of claim 20, wherein  $R^2$  or  $R^4$  is optionally substituted  $C_{1-6}$  alkyl,  $C_{1-6}$  alkyl-heteroaryl, or  $C_{1-6}$  alkyl-heterocycloalkyl; or  $CR^2R^3$ ,  $CR^4R^5$  or  $CR^2-CR^4$  forms the said optionally substituted ring.

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22. The compound of claim 20, wherein B is selected from the group consisting of azetidiny, pyrrolidinyl and piperidinyl, any of which is substituted with  $R^7$ .

23. The compound of claim 22, wherein  $R^7$  is optionally substituted aryl or heteroaryl.

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24. The compound of claim 20, wherein  $S(O)_{0-2}$  is  $SO_2$ .

25. The compound of claim 20, selected from the group consisting of

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4-(1-methoxycarbonylcyclohexylmethylsulfanyl)piperidine-1-carboxylic acid *tert*-butyl ester,

2-(piperidin-4-ylsulfanyl)cyclopentanecarboxylic acid methyl ester,

1-(piperidin-4-ylsulfanylmethyl)cyclohexanecarboxylic acid methyl ester,

2-[1-(4-cyanophenyl)piperidin-4-ylsulfanyl]cyclopentane-carboxylic acid methyl ester,

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1-[1-(4-nitrophenyl)piperidin-4-ylsulfanylmethyl]cyclohexanecarboxylic acid methyl ester,

2-[1-(4-cyanophenyl)piperidin-4-ylsulfanyl]cyclopentanecarboxylic acid,

1-[1-(4-nitrophenyl)piperidin-4-ylsulfanylmethyl]cyclohexanecarboxylic acid and

1-[1-(4-nitrophenyl)piperidin-4-ylsulfinylmethyl]cyclohexanecarboxylic acid.

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26. A pharmaceutical composition for use in therapy, comprising a compound of claim 20, and a pharmaceutically-acceptable diluent or carrier.

27. A method for the treatment of a condition selected from the group consisting of asthma, inflammation, inflammatory diseases, autoimmune, infectious or ocular diseases, age-related macular degeneration, and cancer, which comprises administering to a subject in need thereof an effective amount of a compound of claim 20.